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Division of Mycology and Disease Survey

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March 1, 1936

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

Vol. XX March 1, 1936 Number 4

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The occurrence of pecan diseases in 1935 is reported by H. E. Parson for northern Louisiana, page 77, and by J. F. Cole for other States, page 78.

A report on some new or unusual diseases of ornamentals in New Jersey in 1935, by R. P. White, is quoted from the Nursery Disease Notes of the New Jersey Agricultural Experiment Station, page 79.

INCIDENCE OF EAR ROTS IN THE 1934 CORN CROP

Neil E. Stevens

The information on the incidence of corn ear rots here presented was made available through the courtesy of the Grain Division, Bureau of Agricultural Economics, U. S. Department of Agriculture, and is based on results of licensed inspections of shelled corn receipts at various terminals during June, 1935. For reasons stated in detail elsewhere (Plant Disease Reporter, Vol. 19, pp. 71-73) the total damage of corn received at terminals during June is believed to give in general a reliable index of the amount of ear rots in that portion of the corn crop of the preceding summer which reaches the market during this period and thus at least a fair cross section of the condition of the crop as a whole.

A summary of the incidence of ear rots for the corn crops from 1916 to 1933 inclusive, based on similar material, was published in the Plant Disease Reporter, Volume 19, pages 71 to 93. This is essentially a supplement to the former report. The material is presented in a somewhat different form, due to the fact that, effective September 1, 1934, the official grain standards of the United States were revised and the maximum limits on total damage in corn were changed as indicated in the following tables.

Corn: Grade Requirements Maximum Limits of Total Damage in Official U. S. Grain Standards

Grade No.	Maximum limits of total damage up to September 1, 1934	Maximum limits since September 1, 1934
1	2	3
2	4	5
3	6	7
4	8	10
5	10	15

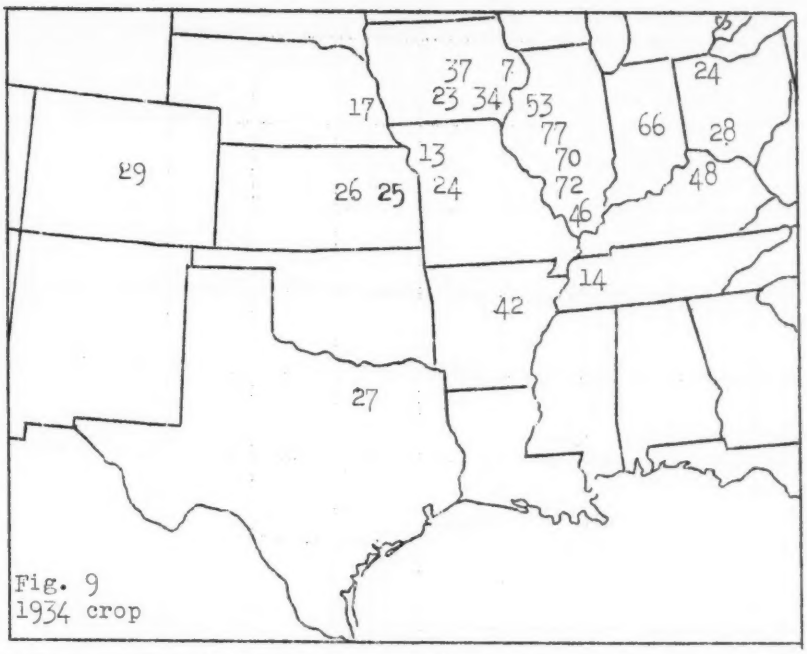

Fig. 9. June 1935 receipts, 1934 crop. Percentage of cars of shelled corn showing over 5 per cent total damage.

In the future then corn showing over 5 per cent total damage will fall below Grade 2, and this appears to be a useful dividing line for use in summarizing the data in hand. As in the earlier report such markets as Chicago, Buffalo, and Milwaukee, which regularly receive shipments from a wide area, are left out of consideration, as are also most of those which received less than 50 cars during June, 1935. The terminals included in this report are: Cedar Rapids, Burlington, Clinton, Des Moines, Iowa; Cairo, Peoria, Decatur, East St. Louis, Illinois; Cincinnati, Toledo, Ohio; Denver, Colorado; Fort Worth, Texas; Indianapolis, Indiana; Kansas City, Topeka, Kansas; Kansas City, St. Joseph, Missouri; Louisville, Kentucky; Omaha, Nebraska; Little Rock, Arkansas; and Memphis, Tennessee. (Figure 9).

Such figures as those here presented are of interest chiefly when compared with similar reports of other seasons. In order to make a direct comparison easier, there is included here, with the indulgent permission of those who prepare the Plant Disease Reporter, the most nearly comparable information for the past 10 years. The figures presented for the years 1925-1933 inclusive are actually simple averages of the corresponding "over 4 per cent" and "over 6 per cent" figures for those years. This of course is not exact, but it must be a close

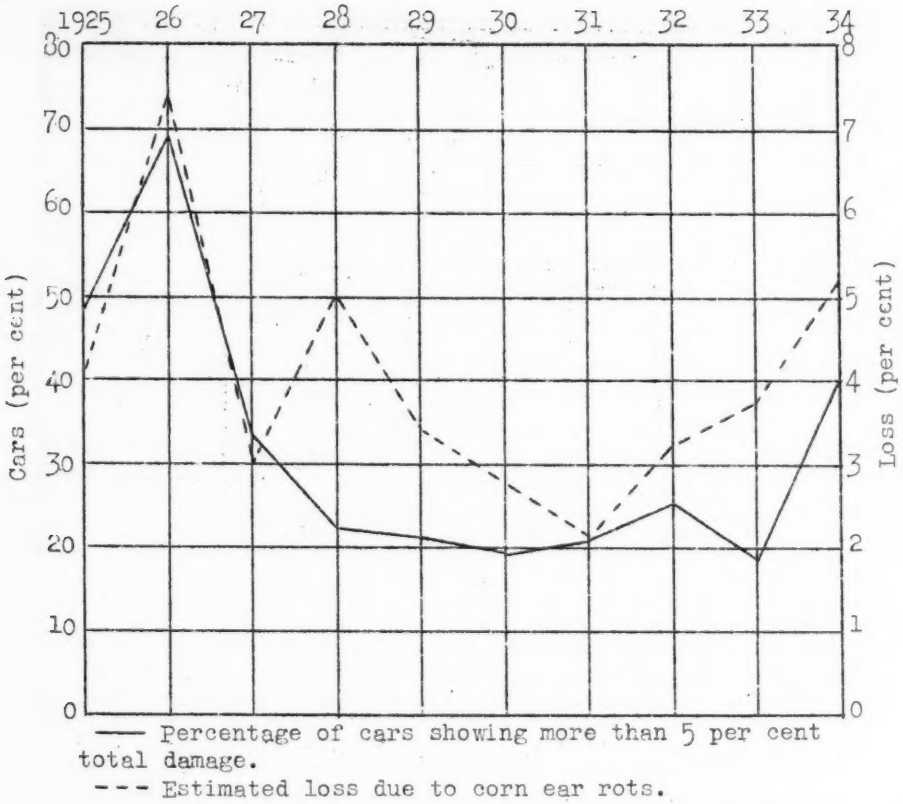

Fig. 10. Incidence of corn ear rots in the various crops as indicated by the percentage of cars of shelled corn received at terminals listed in the text, showing over 5 per cent total damage in June of the following year, and estimated loss due to corn ear rots for the United States as a whole, as reported by collaborators of the Plant Disease Survey.

approximation which can do little violence to the general picture. The information given by the curves (Figure 10) and the figures on the maps (Figures 11 to 20) is self-explanatory and need not be repeated in the text. The outstanding fact is that for a number of the individual terminals the incidence of ear rots in the 1934 crop was the highest in several years and for the average of the whole incidence was the highest since 1926.

Comparison Between These Figures and Those Assembled by the Plant Disease Survey

Attention has already been called (Stevens and Wood, Phytopath. 25: pp. 281-283) to the surprisingly close agreement in the figures for corn ear rots between the estimates assembled by the Plant Disease Survey from the reports of its collaborators and those which are secured by the officials of Federal Grain Supervision. (See Figure 10). The curves are by no means parallel throughout but when it is remembered that one deals with estimates of total losses on the farm and the other with amount of disease in that portion of the crop which reaches terminal markets, the agreement seems surprisingly close. Specifically it should be noted that in both cases the crop of 1934 shows the highest incidence of rots since 1926.

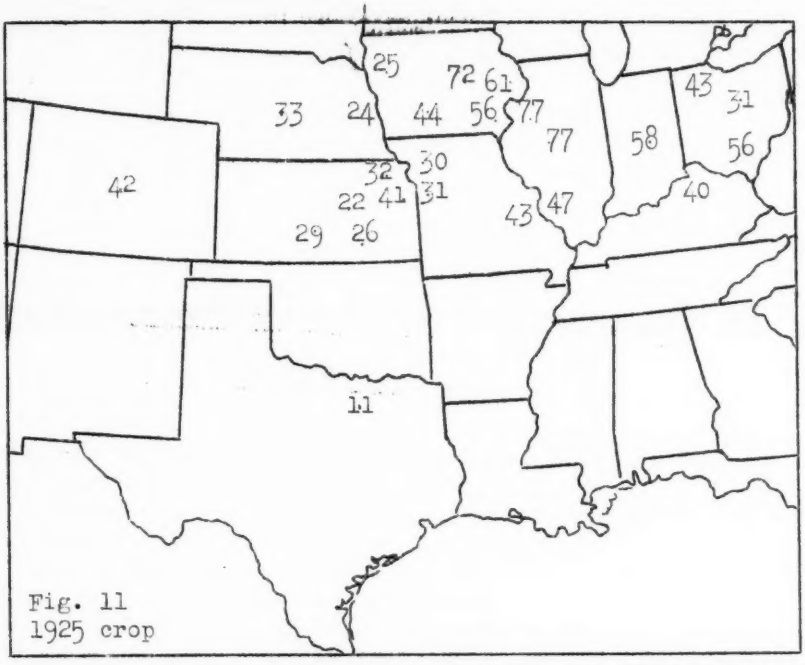

Fig. 11
1925 crop

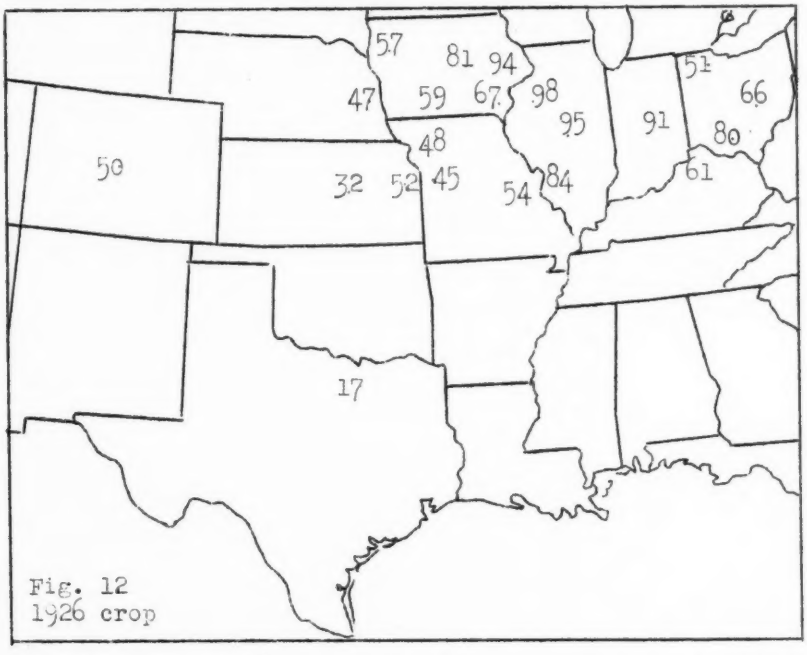

Fig. 12
1926 crop

Fig. 11. June 1926 receipts, 1925 crop. Fig. 12. June 1927 receipts, 1926 crop. Percentage of cars of shelled corn showing over 5 per cent total damage.

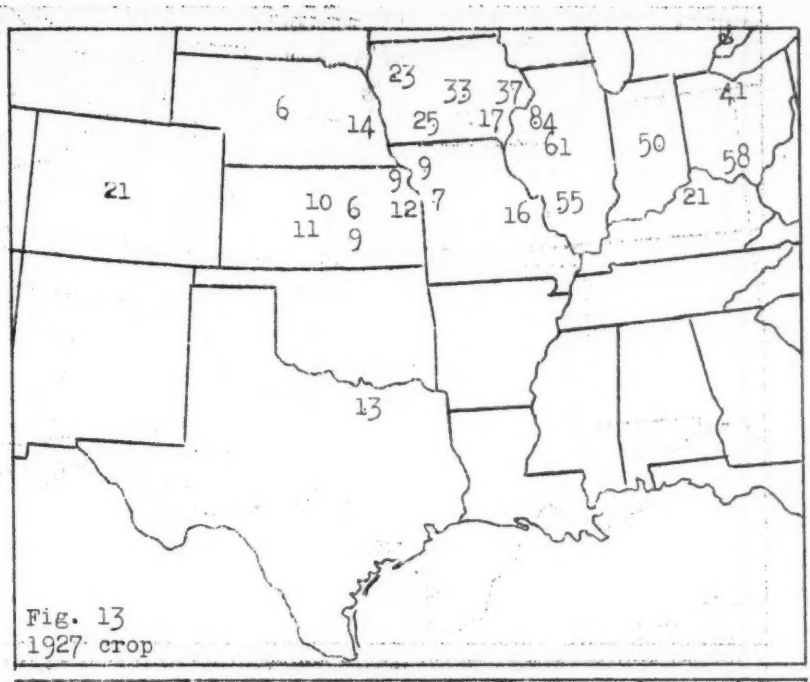

Fig. 13
1927 crop

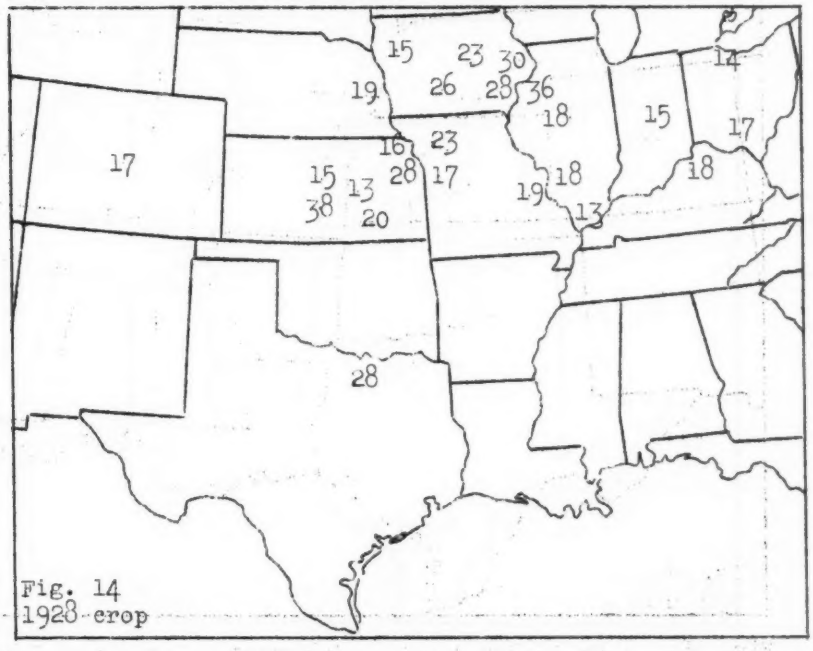

Fig. 14
1928 crop

Fig. 13. June 1928 receipts, 1927 crop. Fig. 14, June 1929 receipts, 1928 crop. Percentage of cars of shelled corn showing over 5 per cent total damage.

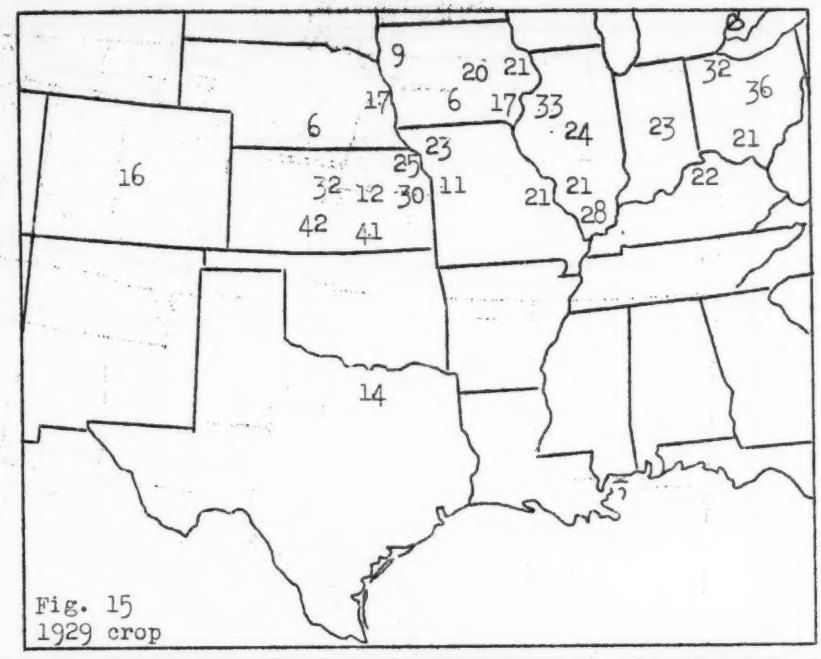

Fig. 15
1929 crop

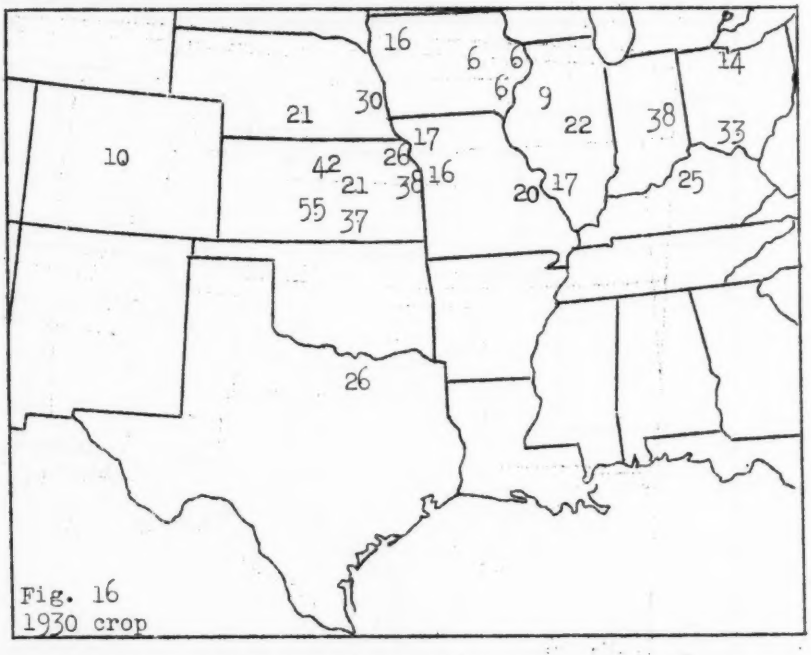

Fig. 16
1930 crop

Fig. 15. June 1930 receipts, 1929 crop. Fig. 16. June 1931 receipts, 1930 crop. Percentage of cars of shelled corn showing over 5 per cent total damage.

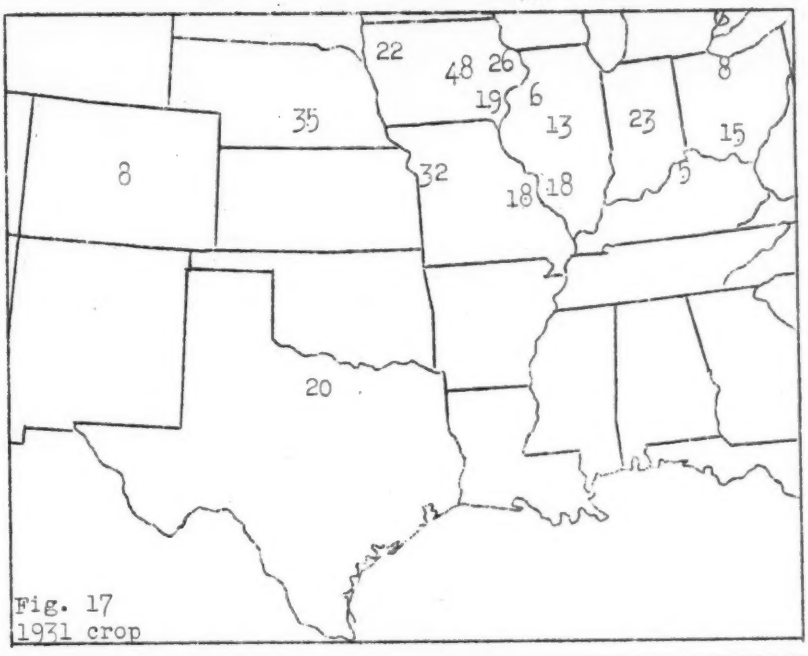

Fig. 17
1931 crop

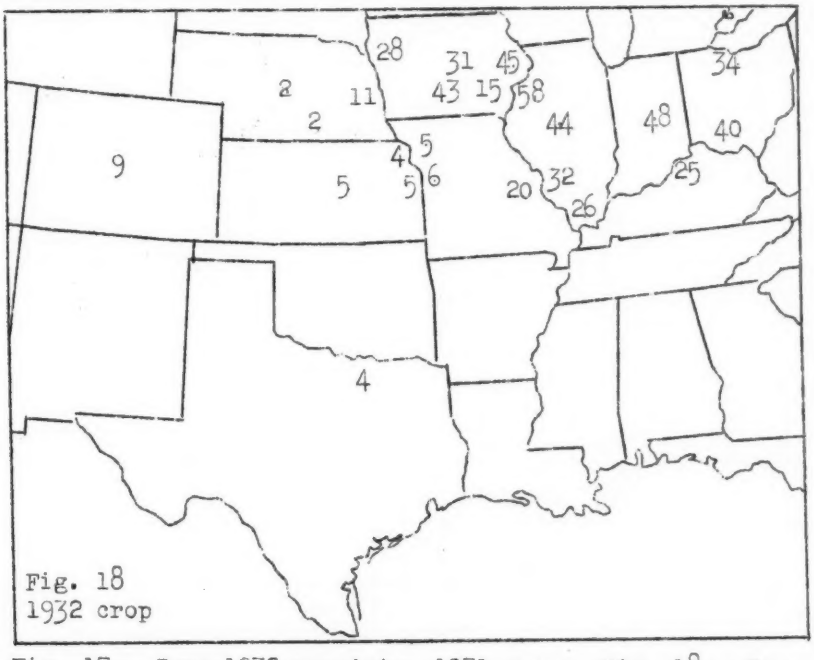

Fig. 18
1932 crop

Fig. 17. June 1932 receipts, 1931 crop. Fig. 18. June 1933 receipts, 1932 crop. Percentage of cars of shelled corn showing over 5 per cent total damage.

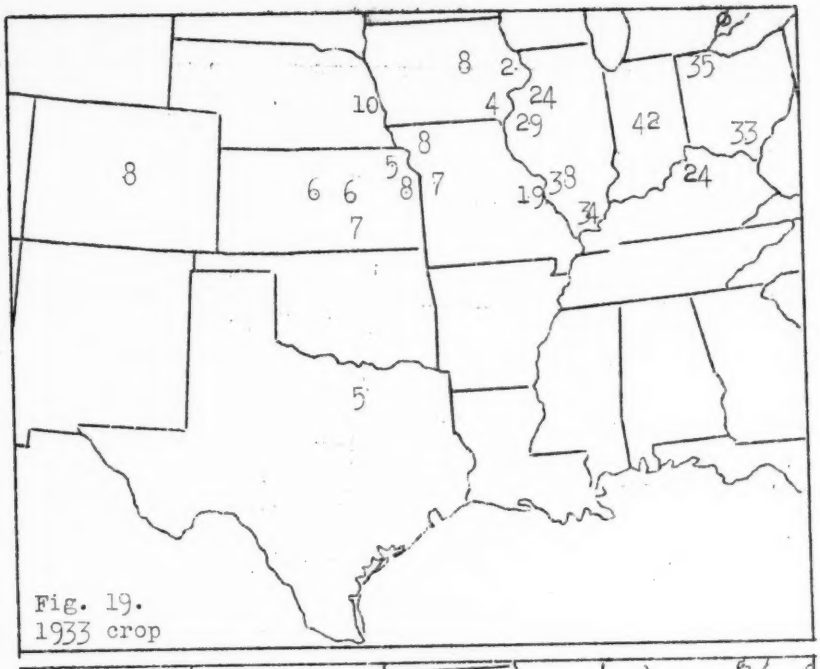

Fig. 19.
1933 crop

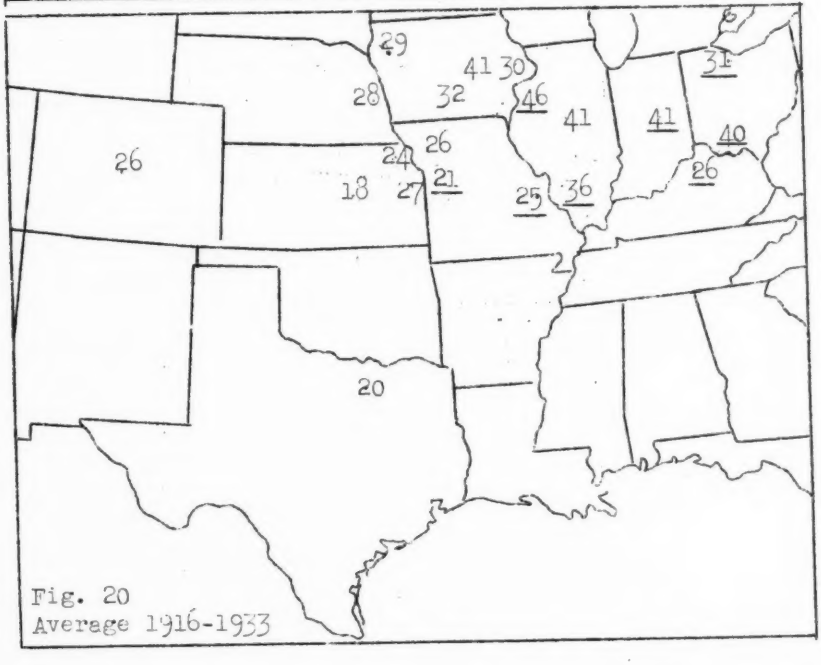

Fig. 20
Average 1916-1933

Fig. 19 (upper). June 1934 receipts, 1933 crop. Percentage of cars of shelled corn showing over 5 per cent total damage. Fig. 20. Percentage of total cars, June receipts, crops of 1916 to 1933, showing over 5 per cent total damage. Average of all available years (Not less than 10. If underlined all 18 years reported).

OCCURRENCE OF CURLY TOP IN THE PACIFIC NORTHWEST IN 1935

B. F. Dana

The 1935 season closely paralleled the 1934 season for extensive occurrence and severity of curly top of vegetables and other susceptible hosts. The relatively mild winter of 1934-35 was favorable to the overwintering of the beet leaf-hopper vector of the curly top virus. The occurrence of especially severe outbreaks of curly top in two consecutive seasons such as has characterized 1934 and 1935 has not previously been recorded for the Pacific Northwest.

The following observations will indicate the importance of curly top in representative areas visited one or more times during the season.

Western Oregon

Willamette Valley

Curly top appeared in the Willamette Valley later in 1935 than in 1934. Leaf-hoppers do not over-winter in the valley and the occurrence of curly top on susceptible plants is correlated with migrations of the leaf-hoppers into the valley from breeding grounds east of the Cascades. Losses in tomatoes ranged from one-half to one per cent for the 1200 acres involved. Curly top also caused small losses in peppers, cucumbers and table beets.

Lower Columbia Area

Curly top was observed in table beets grown for seed. By the first of June it was apparent that only abortive seed stalks would be produced from the mother beets that had been infected during 1934. Some 250 acres of seed beets were plowed under and the land replanted to other crops, mainly potatoes. The cost of growing mother beets, including pitting for the winter, fitting the ground and resetting, totaled $100 per acre according to the growers. At the same time these fields were observed, June 11, a neighboring field of five acres showed less than one per cent loss in the seed crop. This field had been planted late in 1934 for market bunch beets. Thinning had been done systematically during the winter so as to leave roots for a seed crop. The low percentage of curly top is attributed to late planting.

As a result of these observations, a delayed planting of fifteen acres of table beets was made the week of July 7 to grow roots for seed production in 1936. Field examination on October 19, verified by greenhouse test, indicated that less than one-tenth of one per cent of the roots carried curly top virus.

Rogue River Valley

Curly top appeared early in tomatoes in the Medford-Ashland district, but later spread was negligible. Losses for the 650 acres of tomatoes, grown largely for canning in the Rogue River Valley in 1935 were not over one per cent.

Central Oregon

Hood River Area

Losses in tomatoes ranged from light to heavy. Growers' estimates were confused with wilt damage. Acreage in market and home gardens observed aggregated between twenty and twenty-five acres, on which the losses would average 25 per cent.

The Dalles Area

Curly top appeared in tomatoes after harvesting had begun. Losses varied from 5 to 50 per cent with an average of 25 per cent for the 125 acres of tomatoes in this area grown mostly for market. Proportional losses were experienced for peppers and susceptible varieties of squashes and pumpkins. Wilt damage was in many cases confused with damage from curly top.

Bend-Redmond Area

Curly top was said by growers to be more severe on tomatoes and susceptible vegetables than they had previously experienced. Tomatoes were entirely eliminated and severe damage was evident on table beets, spinach, cucumbers and susceptible squash varieties. On August 19, 1935 U. S. #1 Sugar Beets showed severe symptoms in 25 per cent of the plants, but despite curly top promised to yield a fair to good crop.

Eastern Oregon

Milton-Freewater Section

The tomato acreage this year was estimated to be 600 acres about evenly divided between transplanted plants and plants from seed planted directly in the field.

The transplanted stock was grown for market. Plants were grown in plant bands and set in the field as early as weather permitted. Curly top was not in evidence until after harvest had started, but involved nearly half of the crop before the end of the season.

The stock seeded directly in the field at about the time transplanted stock was set out, was grown principally for canneries. The common practice was to seed in hills and allow several plants to develop in each hill. The percentage of plants killed and the reduction in yield was very much heavier than for the transplanted plants. Many fields were almost a total loss.

Curly top was severe on other susceptible crops. A trace was found in the fall crop of spinach grown for cannery purposes.

Eastern Washington

Walla Walla-Dayton Area

Tomatoes in market and home gardens, examined September 7, 1935, showed about 50 per cent loss from curly top. Injury was also evident on spinach and summer squashes.

Clarkston Area

Cucumbers and tomatoes were examined September 7, 1935. Mosaic and curly top were responsible for excessive loss in standard cucumber varieties grown for pickling. Early deterioration of vines and deformed fruits resulted from these diseases. The exact amount of damage from each disease could not be determined.

Losses in fifty acres of tomatoes grown for canning were estimated by cannery men to be nearly 50 per cent. Tomatoes interplanted in orchards showed about 20 per cent loss from curly top.

Susceptible summer squashes were severely injured.

Spokane Valley

Examination of the tomato acreage was made on September 10, 1935. Curly top infection varied from 5 to 40 per cent. Loss was estimated to be 15 per cent for the 500 acres grown in the valley, mostly for market. Wilt was confused with curly top in a few fields. Peppers, cucumbers and susceptible squash also showed injury but losses were low.

Central Washington

Okanogan Valley

In the Oroville section three hundred acres of tomatoes were grown for canning. Curly top appeared before the crop was mature and killed 10 to 15 per cent of the plants. There was little subsequent spread of the disease. Around Okanogan tomatoes and cucumbers

showed very severe injury - as high as 90 per cent in some cases.

Mid-Columbia Area

The entire section along the river between Brewster and Wenatchee exhibited severe injury to tomatoes in gardens. Losses were checked on September 11, 1935 and ranged from 50 to 90 per cent for an estimated total of fifty acres.

In the Cashmere section curly top injury ranged from a trace to 50 per cent, for a total of fifty acres grown for market and canning.

Yakima Valley

Observations made on August 30 and September 2, 1935, covered fields grown for market around Wapato, Donald, Harrah, Toppenish, and Prosser. Curly top had appeared early and continued to spread through the season. In sixteen tomato fields examined, curly top was present on 25 to 90 per cent of the plants. Losses were estimated at 25 to 75 per cent. Many plants had been killed after a partial crop had been harvested.

Both Chinese Giant and Bull-Nose peppers showed severe dwarfing from curly top with the loss estimated at 25 per cent in Chinese Giant and 50 per cent in Bull-Nose. Peppers in gardens showed 5 to 10 per cent of injury.

Injury to cucumbers caused early deterioration of plants. Reduction of yield in many cases was estimated at 50 per cent. Yellow Straightneck and Bush Scallop squashes showed extreme injury. Table Queen squash was also severely injured. Injury to cantaloupe was serious in many fields. In others, the degree of curly top injury was confused with that of other diseases. Early deterioration of vines was apparent with loss in production and quality.

Curly top was very severe in common sugar beet varieties, stands being reduced by 50 per cent and yield by 90 per cent. In the U. S. #1 Sugar Beet 10 per cent of the plants showed severe symptoms and 40 per cent mild symptoms. Yield was estimated at 75 per cent of normal. In U. S. #34 Sugar Beet 2 per cent of the plants showed severe and 25 per cent mild symptoms. Yield was estimated at 90 per cent of normal.

Kennewick-Pasco Section

The county agent of Benton County reported that seed had been put out by the cannery for 600 acres of tomatoes to be seeded directly in the field. Examination of these fields was made September 2, 1935. Seedling infection had wiped out all but fifty acres on which

the crop loss would exceed 50 per cent. Infection in gardens was fully 75 per cent in tomato. Table Queen and other susceptible squash varieties were severely injured.

Western Washington

Puyallup Valley

Observations made September 13, 1935 showed infection ranging from a trace to one per cent in market tomatoes trained to stakes. Some diseased plants had evidently been rogued and destroyed. Diseased plants were a total loss.

Hubbard squash showed late infections in 10 per cent of the plants with little actual loss. About 20 per cent of the cucumber vines showed symptoms of curly top and early deterioration of vines. (Division of Fruit and Vegetable Crops and Diseases).

SECONDARY SCAB INFECTION OF APPLES IN STORAGE

A. B. Groves of the Virginia Agricultural Experiment Station sent in specimens of York apples bearing secondary scab (Venturia inaequalis) infections which developed while the apples were in cold storage. He writes:

"These apples were to my knowledge free from visible evidences of the disease when packed. Two of the apples enclosed were in the face of the pack.

"I am not sending these because of any impression that the condition is unknown or particularly rare, but as a matter of interest relative to the fruit disease situation. It is worth noting that the York and Grimes varieties have been among the most severely affected in this manner, both varieties being considered as very resistant to infection early in the season.

"Secondary scab, and especially storage scab, are both uncommon in this region but unusually favorable scab weather late last summer gave rise to fears on our part that such a condition would develop in packs from improperly protected orchards. The developments now evident confirm our expectations." (Feb. 27)

A report of secondary scab infection was received from New Jersey also, as follows:

"Apple scab on the fruit was reported from several places in Hunterdon County. In some cases the apples were apparently sound before being stored, and the trouble developed in storage. The spots developing in storage were unusually small for scab spots. After the apples were exposed to moist conditions, however, the scab organism fruited abundantly." (Dept. Plant Path.)

PECAN DISEASES IN NORTH LOUISIANA IN 1935

H. E. Parson

Scab (Cladosporium effusum) has not been serious this year. Scattered lesions could be found on some susceptible varieties such as Schley and Georgia Giant. Delmas trees have had heavy enough infection in some cases to cause reduction in yield. Scab has been more serious along the Mississippi River than in Northeast Louisiana. An appreciable reduction in the crop has been caused on Pabst, Van Deman and perhaps on Schley. Owing to the wet spring in this section, it was expected that scab would be much worse than it is.

Vein spot (Gnomonia nerviseda) has been the most aggressive of the three leaf spots most prevalent on pecans in this section. Basal leaflets first defoliated and later the remaining leaflets defoliated. In some orchards defoliation occurred early enough so that a new set of leaves was put out. In other orchards defoliation occurred later and only a few, if any, new leaves were put out. Only a few orchards have escaped premature defoliation. Premature defoliation has seriously affected the quality of the current season's crop and will also operate to reduce the set of nuts in the future. Had not downy spot, liver spot, black aphids and dry weather late in the summer been factors associated with vein spot to cause defoliation, vein spot alone has been serious enough at its worst to have caused complete, early defoliation.

Downy spot (Cercosporella caryigena) has been co-existent with vein spot, but does not appear to do the injury that vein spot does. In the orchards defoliated earliest new infection of downy spot reoccurred on the new leaves.

Liver spot (Gnomonia caryae var. pecanae) appeared later in the season than the two previous leaf spots listed. It has appeared most prevalent on the Pabst and Success varieties. Defoliation by liver spot has not been severe early enough to be of serious consequence. The three leaf spots operating together with black aphids and dry weather have caused complete, premature defoliation of most of the orchards in North Louisiana this year.

Powdery mildew (Microsphaera alni) has been very prevalent on nuts of the Pabst and Success varieties this year. In some orchards the yield of good quality nuts from these varieties is estimated to be reduced approximately one half, but it is doubtful if powdery mildew is the cause of so much reduction in quality of the nuts.

Very little brown leaf spot has been seen on pecans in this section. Blotch has been seen only on Hicoria aquatica growing wild in dense underbrush.

Rosette, a nutritional disease, corrected by the use of zinc sulphate, has caused considerable crinkling and yellowing of the foliage this year. Rainy weather early in the season made it difficult to spray at the critical time to control rosette.

Leaf scorch has been the cause of some defoliation. Certain varieties have suffered more than others. Some orchards in hill land apparently have defoliated from leaf scorch alone, diseases not being of any consequence. (Division of Fruit and Vegetable Crops and Diseases)

PECAN DISEASES IN OTHER STATES - 1935

J. R. Cole

GEORGIA: Scab attacked Schley as far north as Macon. Sixty-five per cent of nuts on unsprayed trees in vicinity of Albany dropped prematurely; 20 per cent of those harvested were unmarketable, and the remaining 80 per cent undersized and poorly filled. A control of about 98 per cent was effected by spraying with Bordeaux mixture. Scab caused a total loss of Delmas and Pabst in south Georgia, and about 50 per cent loss of Frotscher and 10 per cent of Moneymaker in the vicinity of Cairo. The scab fungus was found on the Teche variety for the first time by the writer.

Downy spot was severe, especially on the Stuart and Moneymaker varieties. Where weeds were allowed to grow in the orchards, the trees too thickly planted on the soil, or the soil was eroded or impoverished, the trees were defoliated early in September. Sprayed trees held their foliage until November 15.

Brown leaf spot and leaf blotch were associated with downy spot in causing premature defoliation.

Non-parasitic

Rosette was present in a few orchards, especially those intercropped with corn and cotton. The Stuart is the most susceptible variety.

Leaf scorch caused some premature defoliation of the Moore variety.

FLORIDA: In north Florida, vicinity of Monticello, scab caused a total loss of nuts on the Pabst, Schley, and Success varieties, and some loss on the Mahan variety.

ALABAMA: Scab caused a loss of from 50 to 100 per cent of the Delmas, Pabst, Schley, and Success varieties in central Alabama.

Foliage Diseases. Some premature defoliation was caused by the brown-leaf and downy-spot fungi.

MISSISSIPPI: Scab caused a total loss of nuts on the Pabst variety, and about 50 per cent on Schley in the vicinity of Meridian.

Foliage diseases. The downy, brown-leaf, and liver spot fungi caused some premature defoliation of pecan trees in the vicinity of Meridian. (Division of Fruit and Vegetable Crops and Diseases)

NOTES ON NEW OR UNUSUAL OUTBREAKS OF DISEASES OF ORNAMENTALS IN NEW JERSEY IN 1935

R. P. White

During the past season a number of new or unusual diseases affecting ornamental plants have been observed in New Jersey, as well as rather severe outbreaks either local or general, of some of the more common troubles.

Diseases Severe in 1935

Anthracnose of Platanus occidentalis. The year 1935 witnessed the most severe and general outbreak of this leaf and twig disease (Gnomonia veneta) recorded here in a number of years. It was general over the entire State, on the native plane, and even the inner foliage of many oriental planes was heavily infected. In an ordinary year, the oriental plane is hardly touched, although the native always shows more or less infection.

Complete defoliation was caused on a great majority of the native planes by the last of June. The second crop of leaves were not severely infected, but numerous twig cankers were produced, below which suckering took place, giving rise to irregular, bunchy or witches' broom growths. Many twig cankers 3-4 years old were observed to be callousing over and healing normally as any other injury. The fungus had evidently been killed out in such cankers.

Aster Wilt was observed this year to be unusually severe under cloth although the symptoms were complicated by heavy infections of Botrytis on the stems, where oval, brown, sunken cankers were produced. The wilt-resistant varieties stood up much better against wilt (Fusarium conglutinans callistephi) but were as severely infected with Botrytis as the susceptible strains.

Twig Blight of Pine. A twig blight of 2, 3 and 5 needled pines has been on the increase in New Jersey for several years. It shows up early in the spring and continues during the summer. New growth of the terminal bud may be completely prevented, or varying amounts of growth may take place. The color of the needles of infected twigs is a light brown, and at their bases, beneath the sheath, numerous small, black points, the pycnidia or fruiting structures, occur. Twigs may die back for as much as six inches, and generally there is a slight exudation of resin. Infection is considered to take place early in the spring as new growth starts. Associated with these symptoms is the fungus, Sphaeropsis ellisii.

Diseases Associated with Winter Injury

Canker of Boxwood, caused by the fungus Volutella buxi, is continuing to be a severe disease on winter-injured boxwood. Able to cause severe damage on normal Buxus suffruticosa, the fungus rapidly destroys specimen plants weakened by the effects of severe winter temperatures. Many large specimens, which escaped severe injury in the winter of 1933-34 and 1934-35, have died during the past season as a result of fungous attack. Plants in good growing environment, however, even though injured by both winters, recovered during the summer. It was noticeable that branches infected with this fungus were the first to be injured and showed more severe injury than healthy branches.

Dying of Chestnut Oak. This trouble is correlated with drought, canker worm defoliation and the presence of the fungus Diplodia longispora. Due to the weakening effects of the first two factors, the third factor has assumed the importance of a first rate parasite, becoming systemic and causing the death of large branches and subsequently entire trees. Normally this disease is known only as a twig blight of chestnut oak.

New or Unusual Diseases

Wilt of Berberis thunbergii. Infections of the Japanese barberry with Verticillium dahliae are not uncommon, but during the summer of 1935, two rather large sections of hedge were being killed out. The leaves shrivel up, become brown, and drop. The vascular

discoloration is very evident in some branches, absent in others.

Fasciation of Chrysanthemum. Chrysanthemum plants grown in pots, showed a dwarfed, fasciated, growth of an abnormal number of buds. The same type of fasciation occurs commonly on sweet peas under greenhouse culture. Specimens were forwarded to Dr. Tilford of Ohio, who reports that apparently the same bacterial organism was isolated from these chrysanthemums as he had previously isolated from fasciated sweet peas. The pathogenicity of the latter has been proven.

Corm Rot of Freesia. The corm rot of Freesia, caused by Fusarium sp. is not uncommon in New Jersey greenhouses but is worthy of mention, since it occurred more commonly in 1935 than usual. Growing plants are killed in the benches where they fail to produce bloom or die after an imperfect or small bloom has been cut. Lesions of a pink to brown color occur on the corms. Sorting of corms is recommended as well as a change of soil or pasteurization of the old soil.

Orchid Rust. Specimens of Cattleya leaves were submitted, showing large patches of a yellowish-orange powder on their surfaces which were determined as rust spores. The specimens were submitted to the Division of Mycology and Disease Survey in Washington and Mr. J. A. Stevenson reports it to be Uredo behnickiana P. Henn. (Uredo americana Arth). This specimen, according to Stevenson is apparently the second to turn up in this country. The rust is peculiar in that the uredosori are tufted hyphae protruding through the stomata. The first specimens were received in November of 1934. Infected leaves were cut from the plants shortly after and to date, no reappearance of the disease has been noted. (From Nursery Disease Notes (mimeographed) issued by the New Jersey Agricultural Experiment Station, December, 1935)